

Date: Monday, 15/12/2008 9:22:04 AM  
 User: Julie Dawson

## Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services		Drawing Name	: HIGH AFT X-TUBE 412	
Job Number	: 44069		Part Number	: D412664203TRN	
Estimate Number	: 13210		Drawing Number	: D412-664-243 REV D	
P.O. Number	:		Project Number	: N/A	
This Issue	15/12/2008	S.O. No. :	Drawing Revision	: D	
Prsht Rev.	: NC		Material	:	
First Issue	1 /	Type : CROSSTUBES	Due Date	22/12/2008	Qty: 1 Um: Each
Previous Run	: 42278				
Written By	:				
Checked & Approved By	: <u>Julie Dawson</u>				
Comment	: Est Rev:A 08-03-06 new issue DD verified by:eecc Est Rev B 08.04.02 Removed polish EC verified by: DD				

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :	
1.0	D6009129	Crosstube Material	
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)	
		Pick:	
		Qty Part number Description Batch	
		1 D6009-129 Crosstube <u>B34621</u>	
		Check OD = 3.500"; ID = 2.250"	
2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: MORI SEIKI CNC LATHE LARGE	
		1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166	
		2-Turn first side as per Folio FA166	
		3- File transition lines smooth.	
3.0	QC1	INSPECT ALL DIM TO DIM SHEET	
		Comment: INSPECT ALL DIM TO DIM SHEET	
4.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: MORI SEIKI CNC LATHE LARGE	
		1-Turn second side as per Folio FA166	
		2- File transition lines smooth.	
		3- Remove sand and plugs	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Drawing Name: HIGH AFT X-TUBE 412

Job Number: 44069

Part Number: D412664203TRN

Job Number:



Seq. #: Machine Or Operation:

Description :

4-Scribe part # and batch # using vibrating stylus as per Dwg D412-664-243  
engrave on outside of tube)

Inside of Cuff(Donot

*Am 08.12.16 ①*

5.0 QC1 INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

*Am 08.12.16 ①*

6.0 QC8 SECOND CHECK



Comment: SECOND CHECK

*8-12-18 ①*

7.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

*Am 08.12.18 ①*

8.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*8-12-18-①*

9.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock in kanban rack

Location: *X-Tubes*

*8-12-18*

*8-12-18*

10.0 QC21 FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

*08/12/22 ①*

Job Completion



*mf 08-12-19*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: <u>44569</u>
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: D		Page 1 of 1

### FIRST ARTICLE INSPECTION CHECKLIST

First Article  Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.684	+0.005/-0.000	2.689	/		
	2.748	+0.005/-0.000	2.753	/		
	2.884	+0.005/-0.000	2.889	/		
	3.019	+0.005/-0.000	3.024	/		
	3.163	+0.005/-0.000	3.168	/		
	3.308	+0.005/-0.000	3.313	/		
	3.429	+0.005/-0.000	3.434	/		
	2.990	+0.005/-0.000	2.991	/		
	2.618	+0.005/-0.000	2.618	/		
	0.200	+/-0.010	0.200	/		
	R0.063	+/-0.010	R0.063	/		
	R0.500	+/-0.010	R0.500	/		
	4.971	+/-0.030	4.971	/		
			5.000			
SIDE B	2.684	+0.005/-0.000	2.689	/		
	2.748	+0.005/-0.000	2.753	/		
	2.884	+0.005/-0.000	2.889	/		
	3.019	+0.005/-0.000	3.024	/		
	3.163	+0.005/-0.000	3.168	/		
	3.308	+0.005/-0.000	3.313	/		
	3.429	+0.005/-0.000	3.434	/		
	2.990	+0.005/-0.000	2.995	/		
	2.618	+0.005/-0.000	2.618	/		
	0.200	+/-0.010	0.200	/		
	R0.063	+/-0.010	R0.063	/		
	R0.500	+/-0.010	R0.500	/		
	4.971	+/-0.030	4.971	/		
	124.09	+/-0.020	124.110	/		

Measured by:	<u>a. m</u>	Audited by:	<u>S</u>	Prototype Approval:	N/A
Date:	08.12.16	Date:	08/12/16	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM <u>AF</u>	<u>DS</u>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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NOTE: Date & initial all entries

**DART**

DESIGN <i>PH</i>	DRAWN BY <i>PH</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>GP</i>	APPROVED <i>PH</i>	DRAWING NO. D412-664-243	REV. D SHEET 1 OF 3
DATE 07.03.09		TITLE CROSSTUBE ASSEMBLY (412 HI AFT) NTS	
A	01.10.17	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	06.10.27	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398 MS21920-32 WAS MS21920-30	
D	07.03.09	REMOVE D2732-058, CHANGE TO D3595-063-570	

**RELEASED**07.04.24 *PH*

Qty	Part Number	Description
X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
1	D6009-129	CROSSTUBE
2	D3595-063-570	RUBBER CUSHION
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
2	D3189-1	CHAFING SHIELD
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH =  $124.09 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO  $0.005"$  MAY BE BLENDING OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A  $0.03"$  TO  $0.06"$  THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE **WITHOUT NOTICE** FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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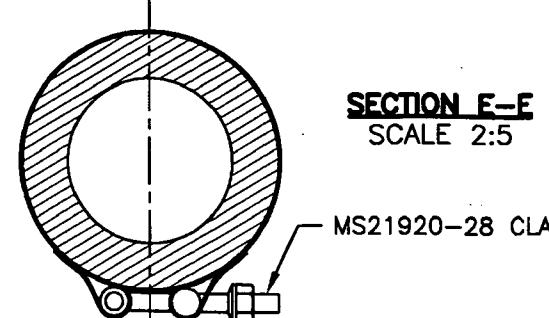
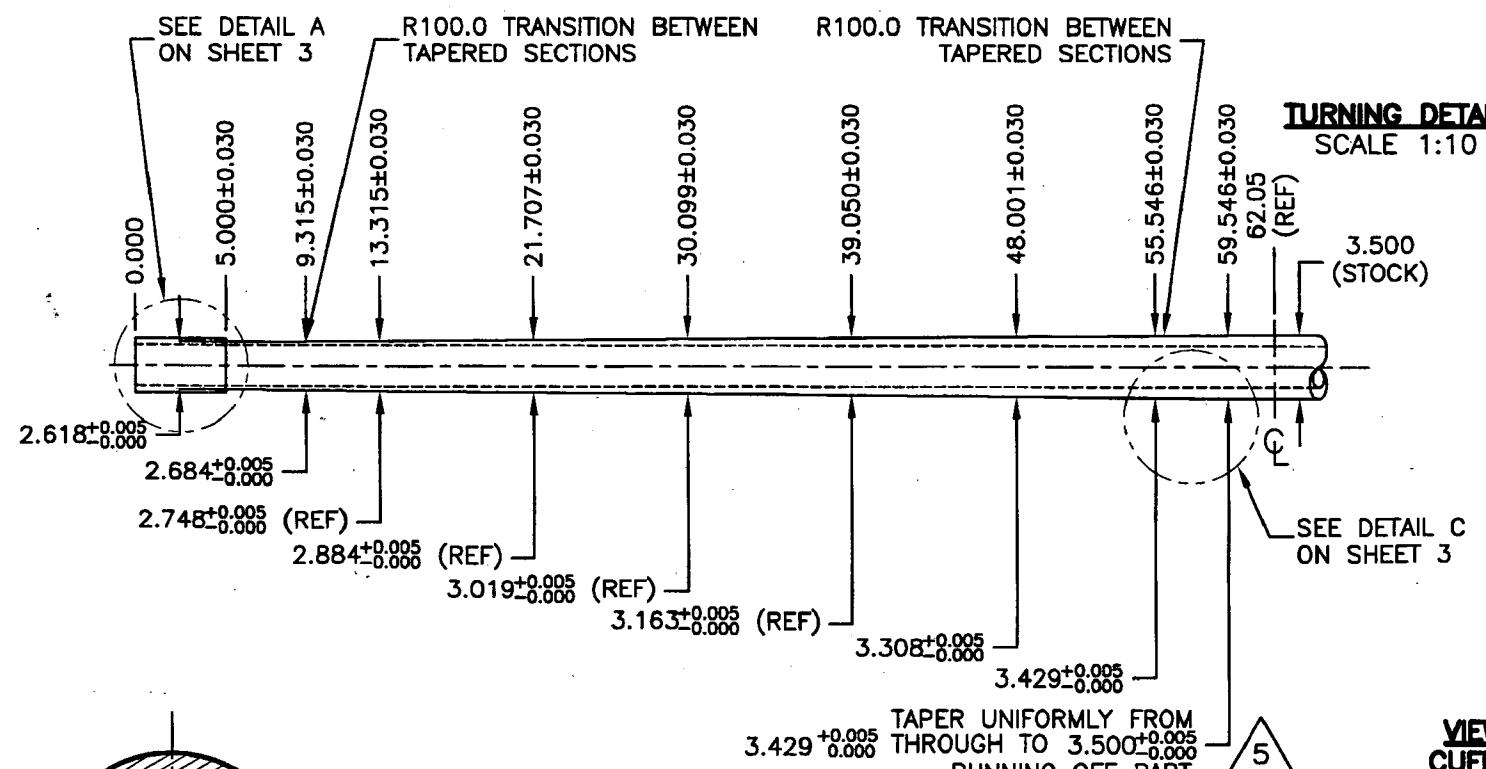
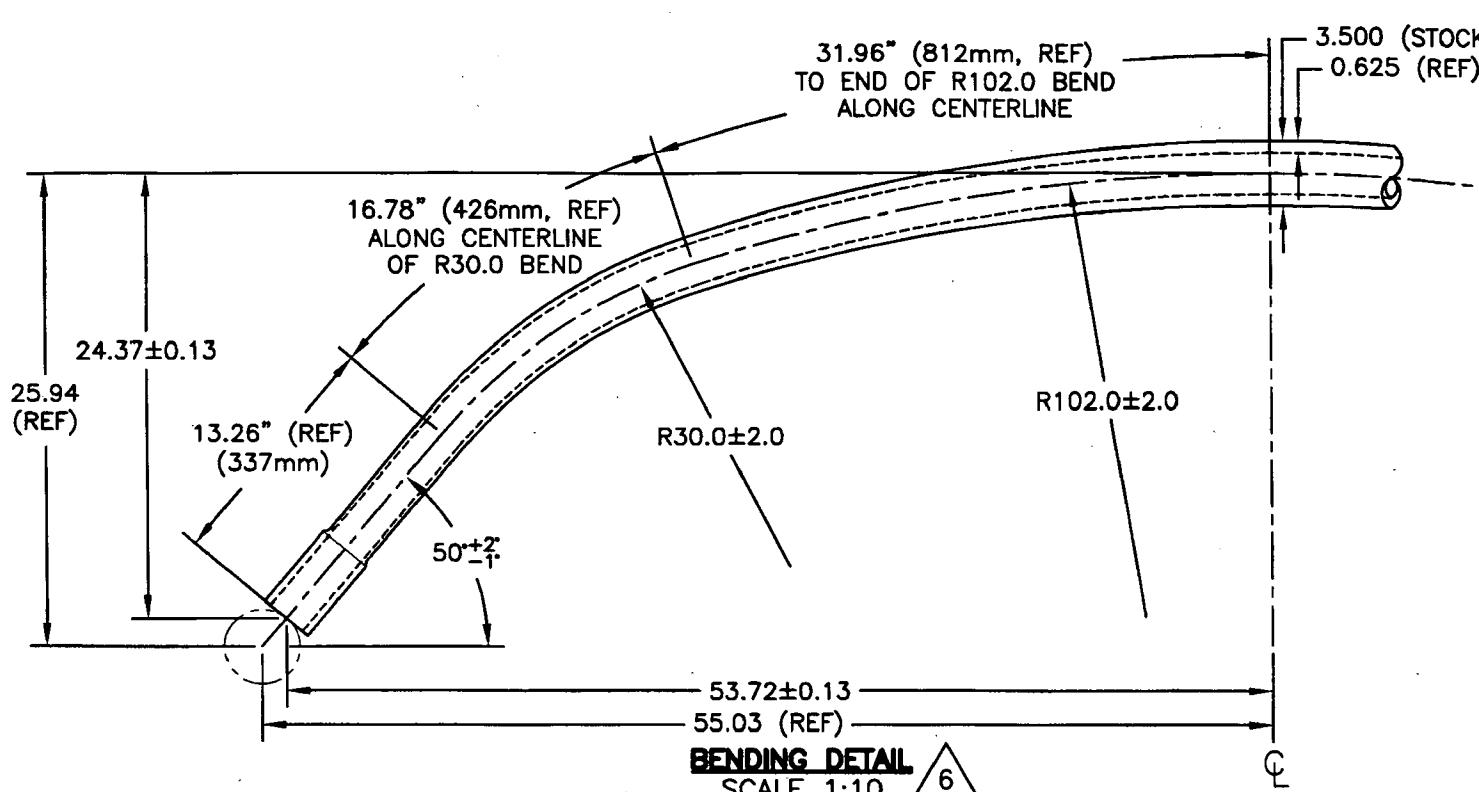
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

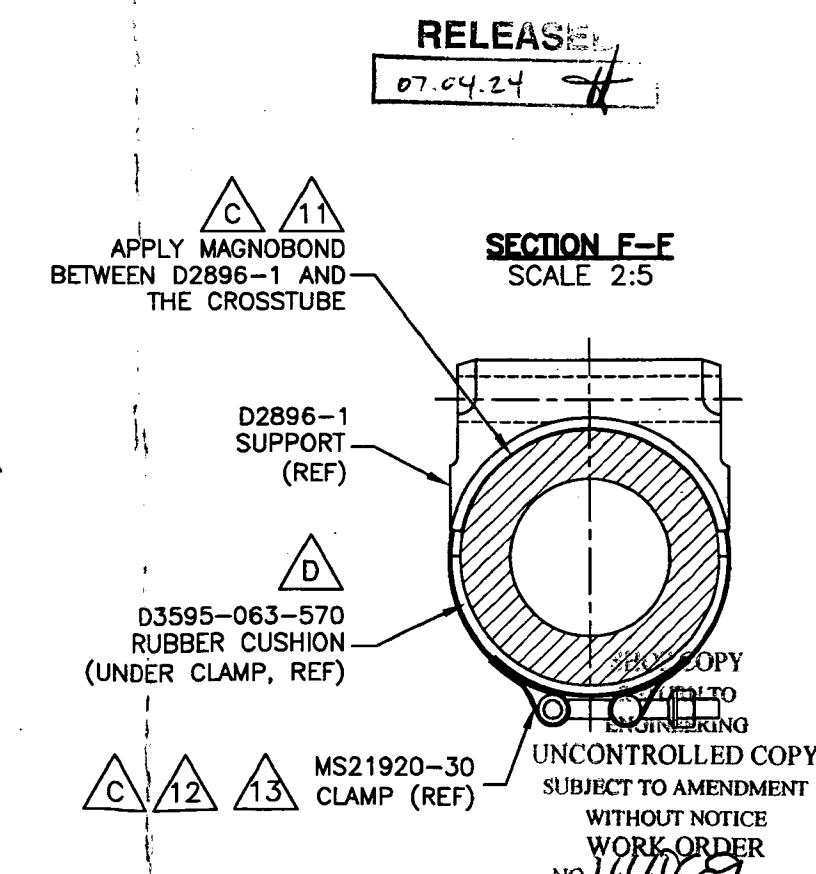
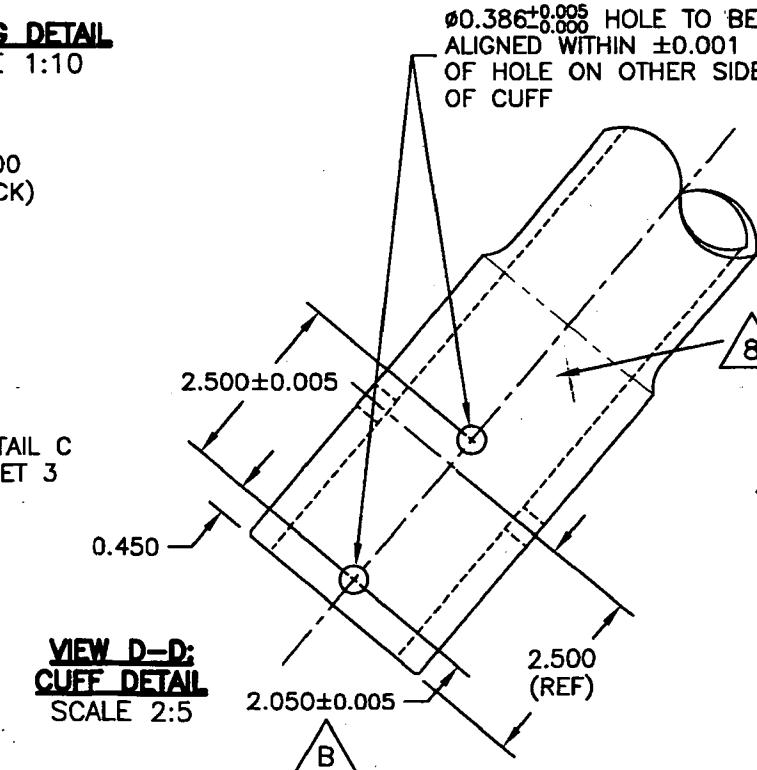
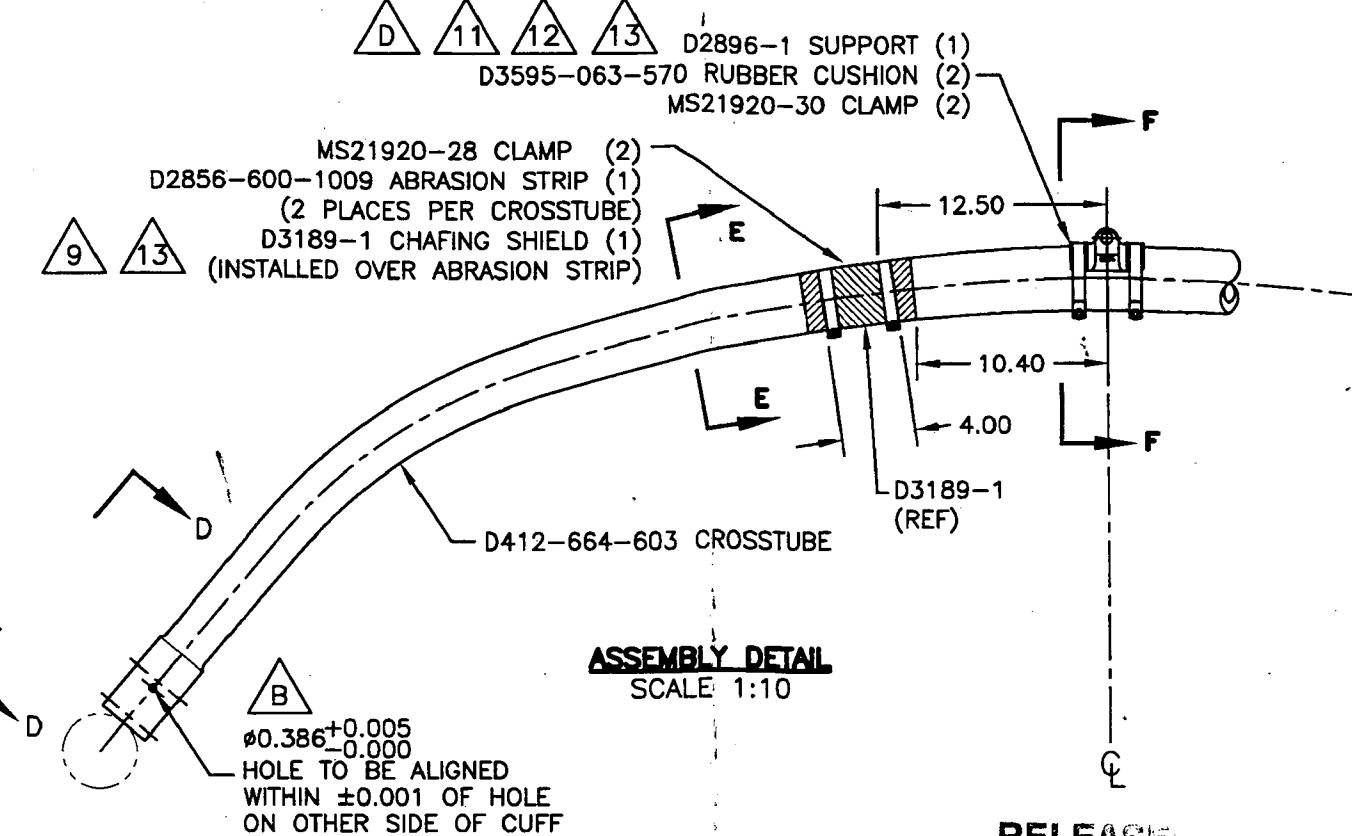
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MS21920-28 CLAMP (REF)



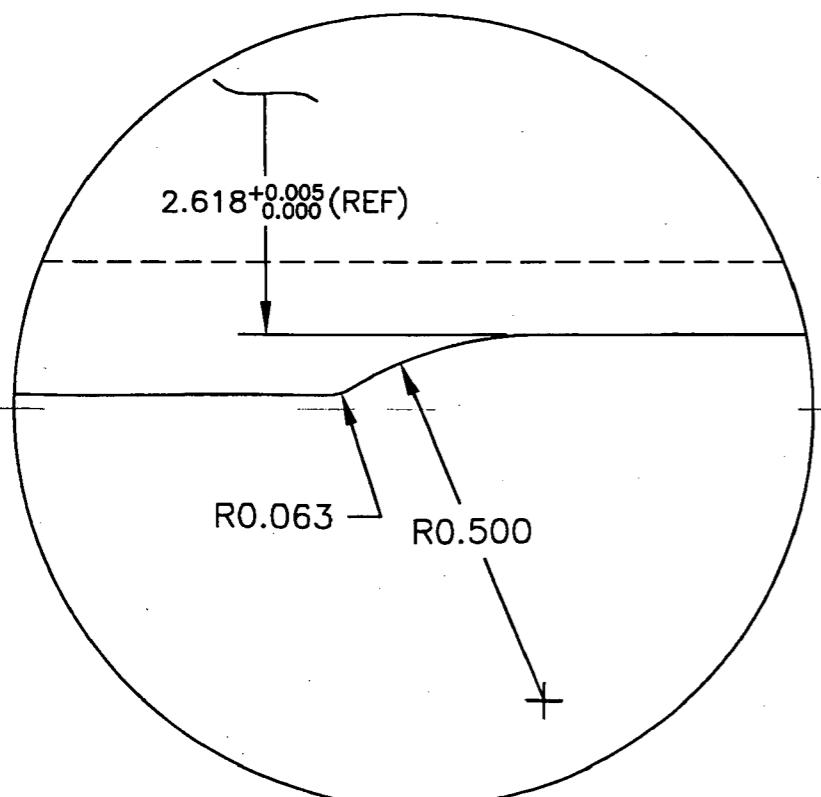
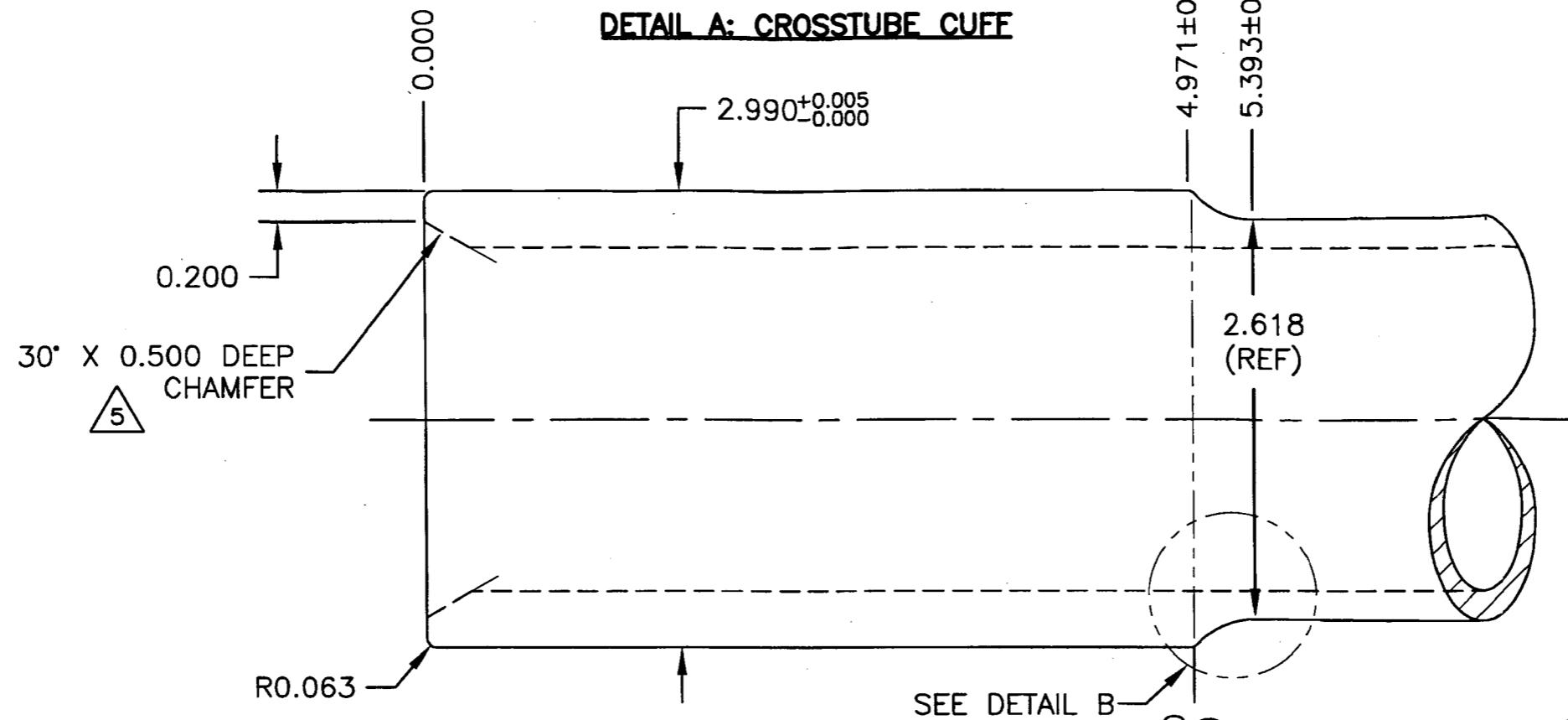
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CHECKED	PH	APPROVED	PH	DRAWING NO.	REV. D
DATE	07.03.09	TITLE	CROSSTUBE ASSEMBLY (412 HI AFT)	SCALE	1:10
					SHEET 2 OF 3

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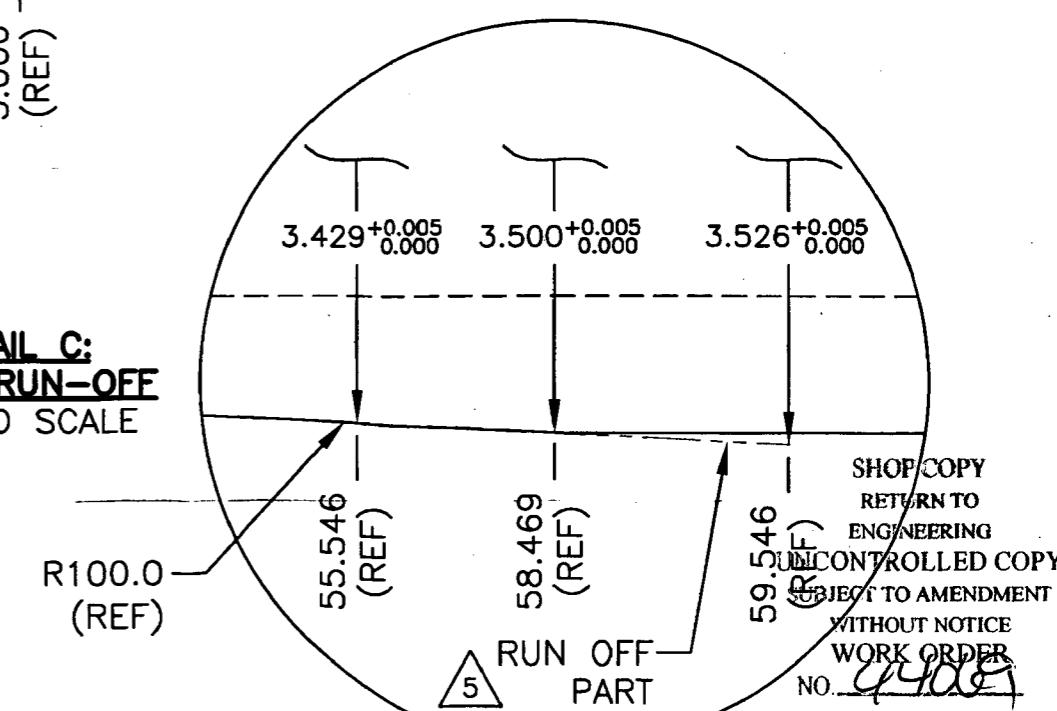
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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAWTHORPE, ONTARIO, CANADA
PH	PH		REV. D
CHECKED	APPROVED		D412-664-243
DATE		TITLE	SCALE
07.03.09		CROSSTUBE ASSEMBLY (412 HI AFT)	1:1

